G R A P H T R I X ™

M A N U A L

VERSION 1.3

DATA TRANSFORMS, INC.
616 WASHINGTON SUITE 106
DENVER, CO 80203
(303) 832-1501

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UPDATE INFORMATION

We at Data Transforms are dedicated to bringing you the best software product that we can offer. Improvements in the GRAPHTRIX Software and Manual will be made as they are developed by Data Transforms. We will be providing your local Apple dealer with update disks as they become available. We are asking them to update GRAPHTRIX disks for their customers as a service. Manual updates will also be available at your local dealer. Updates of both software and manual will also be avaliable to GRAPHTRIX owners directly from Data Transforms by sending the original GRAPHTRIX disk and a check or money order for $10 to:

Data Transforms, Inc.
GRAPHTRIX Update
616 Washington Suite 106
Denver, CO 80203

FEEDBACK

We want to hear how you like the GRAPHTRIX Package. Hearing your comments or suggestions will help us to continue to provide you with the finest software. If you have time, please write us a letter. In any case we hope that your experience with the GRAPHTRIX System proves to be both profitable and enjoyable.

THIS MANUAL

This manual was photographed and reproduced from an original that was written and edited with the Apple Writer and printed with the GRAPHTRIX Matrix Graphics System on an OKIDATA 84 dot matrix printer.

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INTRODUCTION

THE FAST TRACK

FOR VERY EXPERIENCED PROGRAMMERS

If you will read this paragraph we will try to give you the fastest way through this manual.

1.) BOOT your GRAPHTRIX Disk in S6,D1. You will be asked to define your printer/interface configuration. Thereafter you may enter the system by BOOTing or with "RUN MENU"

2.) Look into the specifics of your printer in Appendix A.

3.) If you plan to use the Apple Writer enhancements, MUFFIN the Apple Writer onto the GRAPHTRIX disk. Type RUN MENU to enter the system. You must TRANSLATE a text file before you print it. You must file each picture with the PICTURE FILER before you insert it into a text file. The text embedded commands are on the SYNTAX CARD and in the Chapter titled RETURN TO THE APPLE WRITER.

4.) If you plan to use the screen dump, first try the menu driven HAND HOLDING SCREEN DUMP, then goto Chapter 7 titled GRTX DUMP.

FOR ALL THE REST OF US

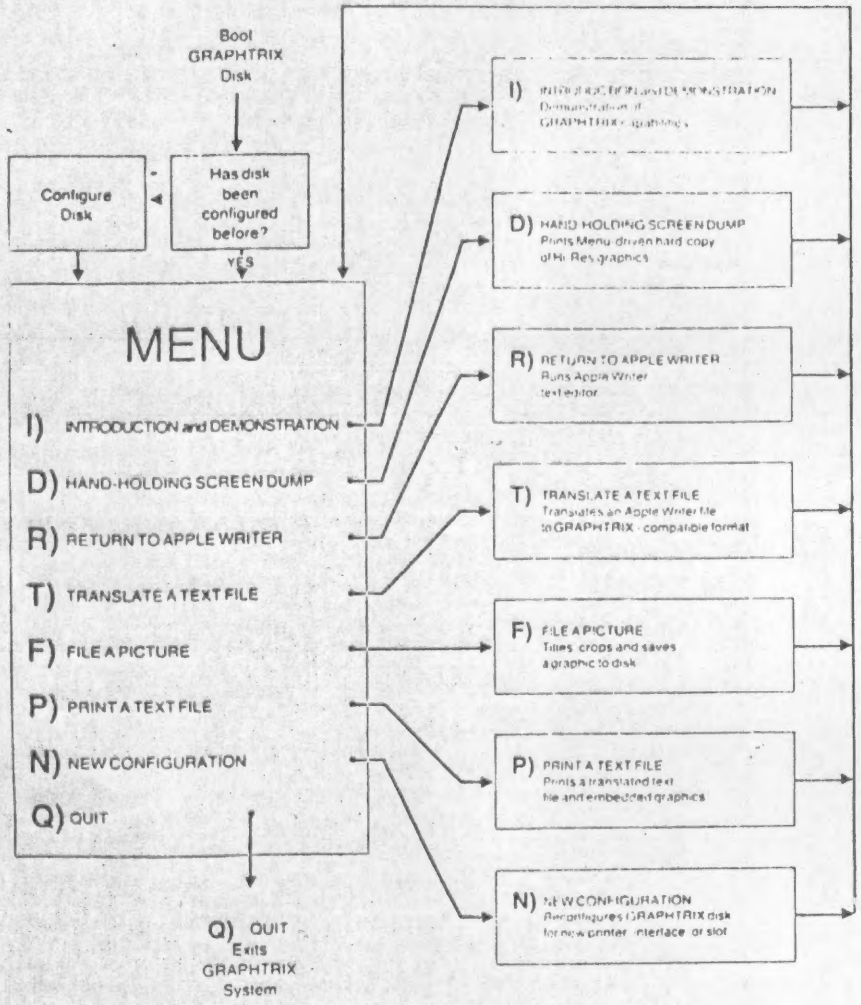
We really recommend that you read the whole manual. There are gobs of things you can do with the GRAPHTRIX System and we'd like to see you be able to have the full power of the GRAPHTRIX system at your command. Chapter 1 is very important, so please read it carefully. Be sure to look at the section in Appendix A on your printer to see if you need to change any switch settings. Happy printing!

IF YOU THINK THIS LOOKS HARD

Not To Worry. It's really pretty simple. At the beginning of each Chapter we have a section called IF YOU ARE LOST... This will help you check to make sure you haven't missed anything. We don't have that section before Chapter 1 though, so if you were lost before you started this manual, Not To Worry. It won't be worse when you finish.

GRAPHTRIX 1.3

FLOW CHART SHOWING OVERVIEW OF GRAPHTRIX SYSTEM



CHAPTER 1

IN THE BEGINNING...

YOU WILL NEED

* An Apple II with Applesoft in ROM and 48k of memory. (An Apple II Plus has Applesoft in ROM)
* At least one disk drive
* D.O.S. 3.3 (this is Apple Computer's 16 sector Disk Operating System)
* One of the following parallel interface cards: Apple Standard, Apple Centronics, Epson APL or Type2, C.C.S. 7728, Mountain CPS, TYMAC, SSM-AIO, Grappler, Prometheus Versacard or PRTI, or the Microbuffer II
* One of the following printers: Anadex 9000/9001/9501/9501, IDS 440G/445G/460/560, Centronics 739/122 EPSON MX-70/MX-80/MX-100, MPI 88G, Silentype, OKIDATA 82A/83A/84, NEC 8023, or ITOH 8510
* A bottle of Champagne and appropriate cheering section for when the pictures first start coming out of your printer.

APPLE MUFFINS

If you are not planning to use the Apple Writer with the GRAPHTRIX System you may skip to the next heading: STARTING UP.

In order to use GRAPHTRIX with the Apple Writer you must convert the Apple Writer to D.O.S. 3.3. To do this use the "MUFFIN" program on your D.O.S. 3.3 System Master. Convert the files from the Apple Writer disk onto your GRAPHTRIX disk.

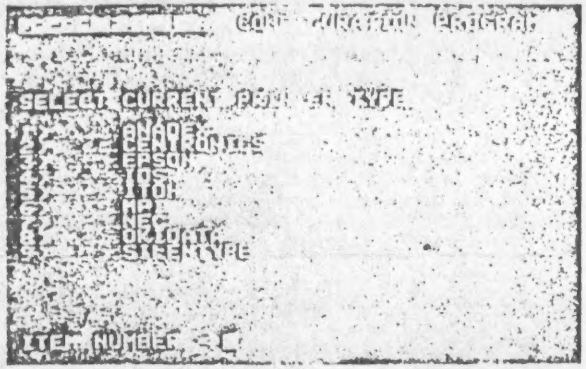
*** DO NOT CONVERT THE APPLE WRITER HELLO PROGRAM AS THE GRAPHTRIX DISK HAS AN ENTIRELY DIFFERENT AND VERY IMPORTANT HELLO PROGRAM.

You will not need to convert the "TUTORIAL" program or the "APPLESOFT" program if you don't want to clutter your GRAPHTRIX disk. Be sure to not lock the "TRANSFER FILE", the "PRINT CONSTANTS", the "GRTX DUMP", the "GRTX PRINTER", the "FILETRANS" or the "PRINT PARAMETERS". These files and programs need to change to fit your needs and you may come up

with a "FILE LOCKED" error if you do. Once you have converted the Apple Writer onto your GRAPHTRIX disk we suggest that you make a backup copy of your GRAPHTRIX disk, to protect your muffins.

STARTING UP

Insert your GRAPHTRIX disk into the Slot 6, Drive 1 disk drive of your system and turn your Apple on. (If you have only 1 disk drive it should be plugged into Slot 6.) After the appropriate clicking and whirring of the booting process your Monitor Screen should give you a Copyright notice. After a short pause you will hear a beep and then you will be given the following choice of printers manufacturers



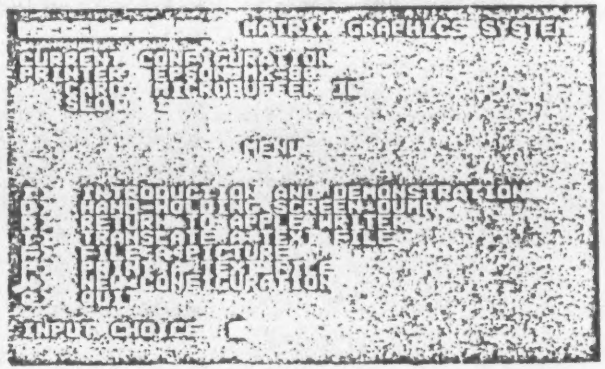
Pick your printer's manufacturer and then press RETURN. Remember that you will always have to press RETURN after indicating your choice to your Apple. Now pick your printer's model number from the ones shown. You will next be asked to give a choice of parallel interface cards. If you don't know whether you have an Apple Standard or an Apple Centronics, try specifying the Apple Centronics. If you are wrong you will see an extra line feed between each printed line of graphics. You can then reRUN the CONFIGURE program and specify the correct card.

If you have a wide carriage printer you will be given a choice of paper sizes. Only the GRTX DUMP program can effectively make use of the wide paper. If you want to change paper sizes as you go along, remember that you must come back and go through the "CONFIGURE" program when you do. If you

don't run through the "CONFIGURE" program when you change paper sizes you may end up printing on the aluminum of the printer or other potentially alarming things. After you enter your paper size you will be asked what slot your controller card is in. If you don't know, turn your Apple off, lift the lid and look for the printer controller card. (It is connected to your printer by that rainbow colored cable and it sticks up vertically out of a plug-in slot in your Apple's main circuit board.) Look at the slot the card is plugged into. It is one of eight slots near the back of the Apple. As you face the Apple's keyboard, the slots are numbered from left to right starting with 0 on the left and moving to 7 on the right. Your printer controller card is most likely in slot #1. Enter the slot number and press RETURN. At this point the GRAPHTRIX disk should come alive and whir and fizz for 15 or 20 seconds. What it is doing is writing your particular system configuration into the GRAPHTRIX programs. You will now be shown.....

THE MENU

You should now see on your monitor screen the following menu:



This same menu will appear at the end of each section of the GRAPHTRIX program with the exception of the machine language routine "GRTX DUMP". There are two ways to dump a Hi-Res Screen to your printer. One of them is the "HAND-HOLDING SCREEN DUMP." The other is the "GRTX DUMP." Using the "HAND-HOLDING SCREEN DUMP" requires no knowledge of programming. It is also a good introduction to the use of

GRAPHTRIX and is immediately rewarding. The "GRTX DUMP" is a multi-purpose screen dump that can be called from your Applesoft program. It is written entirely in Machine Language and executes in under 8 seconds. Of course your printer cannot print the graphics that fast, so the time of dumping a screen is really dependent on how fast your printer can print. Lets find out how fast that is. Choose "D" from the GRAPHTRIX MENU and go to the next Chapter, THE HAND-HOLDING SCREEN DUMP.

REENTRY

After you have booted the GRAPHTRIX once and have made it through to the GRAPHTRIX MENU, you need not go through this HELLO program again unless you change your printer, interface card or paper size. From now on the easiest way to get to the GRAPHTRIX MENU is to insert the GRAPHTRIX disk into your Slot 6, Drive 1 disk drive and type either "PR#6" or "RUN MENU"

CHAPTER 2

HAND-HOLDING SCREEN DUMP

IF YOU ARE LOST...

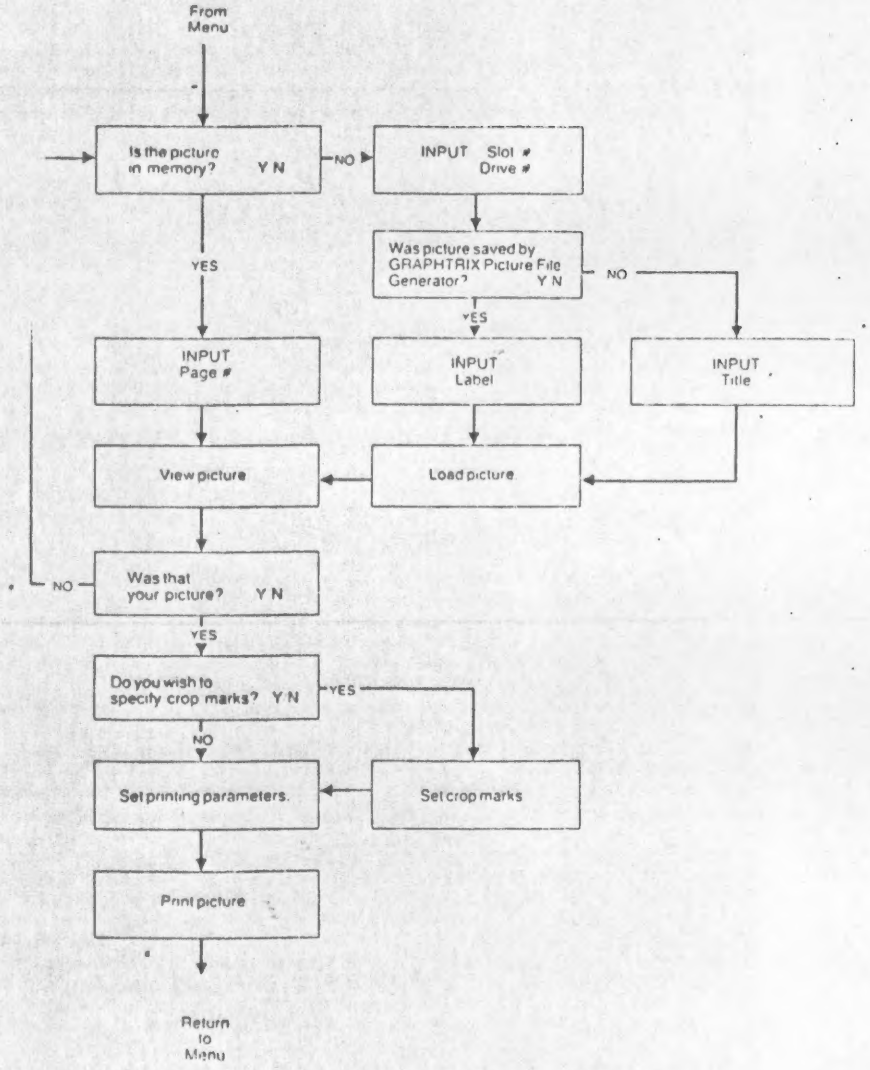
This Chapter describes the operation of the GRAPHTRIX HAND-HOLDING SCREEN DUMP. If you are here you should have read Chapter 1 and you should have booted your GRAPHTRIX disk. Your GRAPHTRIX software should now be ready to print a Hi-Res Graphic Screen to your particular printer and interface combination. You should have pressed "D" from the GRAPHTRIX MENU and should now see at the top of your screen:

If at any time while you are running this program you find that you have entered the wrong data, push CTRL C and then type RUN. You will then be able to start this program again. If you decide that you want to run some other GRAPHTRIX program type CTRL C and then type RUN MENU. If you want to run the HAND-HOLDING SCREEN DUMP directly it is the program on your GRAPHTRIX disk named APL DUMP.

USING THE HAND-HOLDING SCREEN DUMP

The HAND-HOLDING SCREEN DUMP will print any Hi-Res Graphic that you generate. We will leave that up to you. There are a variety of programs on the market that can create quality graphics to your specifications.

FLOWCHART OF HAND-HOLDING SCREEN DUMP



If you refer to the flowchart as you run this program it may help you see where you are. The first question that you will be asked is: "Is the picture in memory?". If you have run the HAND-HOLDING SCREEN DUMP immediately after creating your graphic then your graphic should still be in memory.

GRAPHIC IN MEMORY

If you answer "Y" (Yes my graphic is in memory), you will be asked which Page your graphic is on. If you had used the Applesoft statement HGR to create your graphic, you should answer "1". If you had used the statement HGR2 you should answer "2". You will now be shown the page you specified and asked if that was your picture. If you answer "N" you will go back to the beginning. If you answer "Y" you will go to HIGH AND LOW CROP MARKS

GRAPHIC NOT IN MEMORY

If you had answered "N" (No my graphic is not in memory) you will next be asked if this is a graphic that had been previously defined by the GRAPHTRIX PICTURE FILER. If this seems mysterious, no doubt you haven't even tried to use the PICTURE FILER yet. Not To Worry. Just answer "N" and go on. You will next be asked what Slot and Drive your graphic is saved in. Slot 6 and Drive 1 are the proper answers for a one disk system. Next you will be asked for the name you used to save your graphic. Give that information and you will be given a prompt to allow you to insert the proper disk. You will see your graphic being loaded from disk and then you will be asked if that was the correct graphic. If you answer "N" you will go back to the beginning. If you answer "Y" you will go to HIGH AND LOW CROP MARKS

HIGH AND LOW CROP MARKS

Next you will be asked if you would like to specify high and low crop marks. If you like your picture the way it is, then answer "N" and go to MAGNIFICATION INVERSE AND CENTERING. But if you really had always wished that you could cut a little off the top or a little off the bottom, then answer "Y". If you answer yes you will be given a message that will remind you that you will be shown your picture with horizontal lines at each 10 spaces from the top. Not To Worry. The HAND-HOLDING SCREEN DUMP will not forget how your picture used to look. Press the space bar and you will now see your picture with the spacing lines. Specify both the high and low crop marks by counting down from the top. Remember, the horizontal lines are at markings 10, 20, 30, ...170, 180. You may specify any number in between those marks if you need an exacting crop.

Press the space bar again and you will be asked what the high crop mark is. Remember that 0 is the top of the screen and 191 is the bottom of the screen. Likewise you will be asked what the low crop mark is. The high crop mark must be a smaller number than the low crop mark.

MAGNIFICATION INVERSE AND CENTERING

You will next be asked to specify the magnification that you wish. Maximum magnification varies from printer to printer depending on size of paper, and dot spacing. Some printers can only print one magnification, some print up to three. Consult Appendix A for the maximum magnification available for your printer.

Next question is "Normal or Inverse?" If you want black letters and lines on a white background of paper, specify "I" for Inverse. (Notice that on your monitor you have white letters and lines on a black background.) If you specify "N" for normal you will see black where you see black on the monitor.

Last but not least you will be asked if you want page centering. If you answer "Y" the program will issue the correct number of line feeds to center your picture on an 11 inch long form. If you start the paper at top of form, you will see that the paper is left at top of form when you finish. This is especially useful since the Anadex, Epson and the Okidata 84 printers otherwise lose track of their Top of Form. If you answer "N" the program will print the graphic with only one line feed before and after the graphic. In this case your Anadex, Epson or Okidata 84 printer will think that the final position of the paper is the new top of form. If you have an MX-100 and you have specified 14 inch wide paper, the page centering function will not work.

Time to bring in the cheering section and chill the Champagne. You are now at the final prompt. When you press any key your printer should respond with the satisfied buzz of GRAPHICS.

MOVING ON

You will now see the GRAPHTRIX MENU again. If you do not wish to use the Apple Writer with GRAPHTRIX then go to Chapter 7: THE GRTX DUMP. If you want to print Graphics in with your text files, then its time to RETURN TO THE APPLE WRITER. Press "R" and move on to the next Chapter.

CHAPTER 3

RETURN TO THE APPLE WRITER

IF YOU'RE LOST...

This Chapter describes the text embedded commands that you can use from the Apple Writer to control the GRAPHTRIX printing program. You should have already read Chapter 1 and run the GRAPHTRIX "HELLO" program before you go through this section. As you look at your monitor, you should see the Apple Writer Editor Menu. If this looks at all unfamiliar to you, its time to go to the beginning of the Apple Writer Manual and learn how to use the Apple Writer. If you're chomping at the bit to see some pictures printed in your Apple Writer text, well do read on.

In order to return to the GRAPHTRIX MENU type "Q" for Quit and then type "RUN MENU".

TEXT EMBEDDED COMMANDS

Text embedded commands in the Apple Writer take the format of:

!{command}{number}

In the Apple Writer all text embedded commands must be both preceded and followed by a RETURN. This will be true for the graphics control command.

Just as in the Apple Writer, if the syntax of your command is in error, the GRAPHTRIX printing program will not recognize the command and print the command as it would any other text. The Apple Writer printing program does not recognize the GRAPHTRIX commands and will print them as it would any other text.

THE GRAPHICS COMMAND

The format of the graphics command is as follows:

!gr,(type)(number),m(number),(n or i),t"(title of picture)"

Lets go through this command taking each part that is set off by commas one at a time, first starting with "!gr".

!gr This identifies the command as a graphics command.

,(type)(number) This identifies the particular graphic you wish to have inserted in your text. There must be a graphic with the type and number you have specified that has been saved on your disk. There are five types of graphic that you may specify. These are:

fig	(figure)
ill	(illustration)
gph	(graph)
tbl	(table)
equ	(equation)

The number must be a number between 0 and 9 inclusive. An example of these two required parts of the graphic command would be:

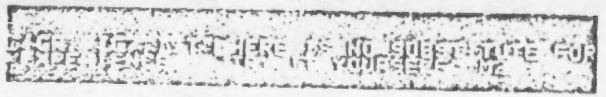
Each of the rest of the parts to the graphics command are optional and may be included in any order.

,m(number) This part specifies the desired magnification. The number may be either 1 or 2. Numbers larger than 2 default to 2 for most printers. The Epson MX-80 and MX-100 can print Magnification 3 graphics on 8 1/2" wide paper

,(n or i) This part specifies whether you wish to print in normal or inverse mode. If you want to see black where you had seen black on your monitor screen, use "n" for Normal. If you have white characters or lines on your monitor screen that you wish to be printed as black lines use "i" for Inverse. Note that the illustrations in this manual were printed in the "n" mode.

,t"(title of picture)" Of course by now you've guessed what this specifies. The title may be any series of up to 240 characters except a quotation mark or a RETURN. The title must begin and end with a quotation mark.

Here is a sample graphics command:



Note that although the first two parts of the command must be properly placed, the last three can be in any order. In fact the last three parts can be left out altogether. If you do leave out any of the last three parts of the command, the GRAPHTRIX printer program will default to the value last used. If you want to print a picture with no title you must specify t"". If you don't the GRAPHTRIX printer program will center and print the last title it used. If in the first graphic command in your text you leave out any of the last three parts of the graphic command, the GRAPHTRIX printer program will use the following default values:

Magnification 1, Inverse, No title.

GRAPHIC PLACEMENT

The GRAPHTRIX printer program decides where it is placing the graphic you have called for with your graphic command. It follows this procedure when it recieves a graphic command: If there is room left on the page to print the graphic and not overstep the bottom margin, the GRAPHTRIX printer will print the graphic immediately. If there is not room on the page the printer program goes on printing lines of text until it has finished the present page. Then it prints the graphic at the top of the next page. If the program runs into a second graphic command while it is holding a graphic for placement on the next page it prints that graphic immediately following the graphic it has on hold. If the printer program runs into a third graphic while it has two on hold it will forget the second graphic and remember the first and last graphic.

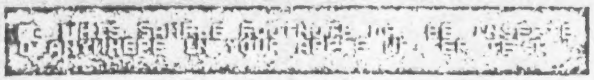
THE FOOTNOTE COMMANDS

The first thing you should note is that "footnote commands" is plural. There are two parts to processing a footnote: the footnote itself and the reference to the footnote. These commands are different than the Apple Writer commands, so pay attention.

The format for entering a footnote into your text is as follows:

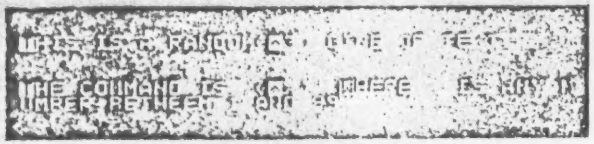
^(number)"(footnote text)"

Here is a sample footnote entry:



Just as in the Apple Writer commands, the footnote must be preceeded and followed by a RETURN. The "^" symbol must appear on your monitor screen in inverse. In other words you must type ESC SHIFT N. The "^" symbol will appear as black in a small white box, just as your capital letters do. The number may be any number between 0 and 99. If you use the same number for two footnotes, the printer will only recall the last referenced occasion of that number. The footnote text can be any series of up to 240 characters that does not include a quotation mark or a RETURN. The footnote may be added at any point in your text and will still be formatted and placed properly.

The format for referencing a footnote in your text is as follows:



As you can see from the example, the footnote reference command does not need to be surrounded by RETURNS. It is quite comfortable residing in any paragraph of text. Once again the "^" symbol must be in inverse mode. Again you must type ESC SHIFT N to obtain that character. The footnote reference will be printed as a superscript number. If you have specified End-Of-Page footnote mode, your footnote will be retrieved and put on the list of footnotes to be printed at the end of the page.

SUPERSCRIPTS

The footnote reference command can be used for another purpose not at all connected with footnotes. If you use anything but a number in the footnote command, the printer will not attempt to find a footnote, but will only print the characters in the command as a superscript. This lends itself to a variety of applications.

For instance:

Prints as: GRAPHTRIX^{TM}

If you try to use the Superscript to print a number, you may get various unusual results. This option is not recommended, but can be accomplished by specifying blank footnotes for every number up to and including the referenced superscript.

LIMITATIONS

There are several limitations on the number and size of footnotes. As we mentioned previously each footnote may not be longer than 240 characters. In addition if you have specified End-Of-Page formatting and you try to print footnotes that total more than 920 characters you will get an OUT OF MEMORY error when you try to print your file.

MOVING ON

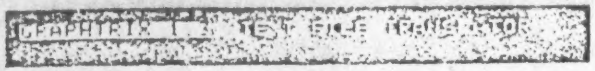
At this point it is suggested that you use your Apple Writer to write some text in order to test the capabilities of the GRAPHTRIX Matrix Graphics System. After you have saved your Apple Writer file and are at the Apple Writer Editor Menu, choose the (Q) QUIT option and then type RUN MENU. You should then see the GRAPHTRIX MENU on your monitor. Choose the "T" TRANSLATE TEXT FILE option, and move on to the next Chapter.

CHAPTER 4

TRANSLATE A TEXT FILE

IF YOU ARE LOST...

This Chapter describes the operation of the GRAPHTRIX text file translator. If you are here you should have read Chapters 1, 2 and 3. You should be familiar with the Apple Writer's operation and should be familiar with the text embedded commands used in the GRAPHTRIX Matrix Graphics System. You should have created and saved a text file with the Apple Writer that can now be translated. You should have pushed (Q) for QUIT from the Apple Writer Menu and typed RUN MENU. You should have pushed (T) for TRANSLATE A FILE from the GRAPHTRIX menu and you should now be seeing:



If at any time while you are running this program you find that you have entered the wrong data, push CTRL C and then type RUN. You will then be able to start this program again. If you want to exit this program and run another GRAPHTRIX Program type CTRL C and then type "RUN MENU".

USING THE TRANSLATOR

First you will be asked to identify the slot and drive that your Apple Writer text file is in. Go ahead and give the Translator that information. Next you will be asked which slot and drive you wish to have the GRAPHTRIX text files saved in. Go ahead and give that information. If you have only one disk drive and you want to put the GRAPHTRIX text file on a different disk than the Apple Writer text file, Not To Worry. The Translator will stop and give you a prompt before it does anything rash.

Next the Translator will ask you for the title of the text file to be translated. Type in the title exactly as you typed it to the Apple Writer when you saved your text file. The

Translator will next ask what name you wish to use to save the GRAPHTRIX text file. You may use the same name if you like and it will not erase your Apple Writer file even if they are both on the same disk. The Translator only uses the first 15 letters of your name, so be careful naming two GRAPHTRIX files with names that only differ in the last couple of letters because you will erase any GRAPHTRIX file with the same first 15 letters. GRAPHTRIX file names may NOT end in a number.

The Translator will next ask for the Chapter number. The Chapter number can be any number between 1 and 99. The Chapter feature is useful for chaining long Apple Writer files together. With this feature, the length of your document is only limited by the number of characters that can be stored on one disk. (approximately 140,000)

You will now be asked to insert your Apple Writer text files disk and press any key. Go ahead. After a few seconds of whirring and spinning the Translator will prompt you to insert the disk on which you wish to save your GRAPHTRIX files and then press any key. Go ahead and do this. The disk will whir a little longer this time. What it is doing is translating and segmenting your Apple Writer file and creating a seperate file for the footnotes.

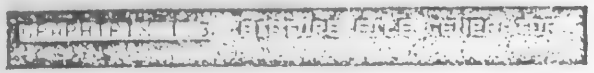
You will now be back once again to the GRAPHTRIX MENU. If you have any pictures that you are wanting to include in your printed document, it is time to press "F" for "FILE A PICTURE". If you didn't really want to be printing pictures in your documents then press "P" and go ahead and skip the Chapter "FILE A PICTURE".

CHAPTER 5

FILE A PICTURE

IF YOU ARE LOST...

This Chapter describes the operation of the GRAPHTRIX picture filer. If you are here you should have read Chapters 1 thru 4. You should be familiar with the Apple Writer's operation and should be familiar with the text embedded commands used in the GRAPHTRIX Matrix Graphics System. You should have created and saved a text file with the Apple Writer and have translated it into a GRAPHTRIX text file. You should have pressed "F" FILE A PICTURE from the GRAPHTRIX MENU and you should now be seeing:



If at any time while you are running this program you find that you have entered the wrong data, push CTRL C and then type RUN. You will then be able to start this program again. If you want to exit this program and run another GRAPHTRIX Program type CTRL C then type RUN MENU.

SAVING A PICTURE ON DISK

The Picture Filer was written to create picture files that can be inserted into your Apple Writer text files. In order to use the Picture Filer you must have a Hi-Resolution screen saved on a disk as a Binary file. If you have never saved a Hi-Res screen, here's how. First create your Hi-Res picture. We will have to leave that up to you. If you were using the statement HGR you had created an image on Hi-Res page 1. To save your image which you may have titled "CONFUCIUS", type: BSAVE CONFUCIUS,A$2000,L$2000. If you were using the statement HGR2 you had created an image on Hi-Res page 2. To save an image from page 2, type: BSAVE CONFUCIUS,A$4000,L$2000

USING THE PICTURE FILER

The Picture Filer will first ask you to identify the slot and drive in which your picture is saved. Give the Picture Filer that information. You will then be asked whether you are redefining title or crop marks for a previously defined picture. If you have not run your picture through the PICTURE FILER before, answer no. If you are trying to load a picture from disk that had been previously filed, answer yes. Next it will ask you to type the title of the picture to be filed. You will then be asked to insert the disk on which your picture is saved and press any key. Go ahead and do that now. The Picture Filer now reads your picture into the Apple's memory.

Next you will be asked to label your picture with a type. This should be the same type that you specified in your text embedded graphic command. Go ahead and press a number to label this picture. You will then be asked to give a number for this picture. Once again this number should match the number that you specified in your text embedded graphic command. (Remember the number must be between 0 and 9)

HIGH AND LOW CROP MARKS

Next you will be asked if you would like to specify high and low crop marks. If you like your picture the way it is, then answer no. But if you really had always wished that you could cut a little off the top or a little off the bottom, then answer yes. If you answer yes you will be given a message that will remind you that you will be shown your picture with horizontal lines at each 10 spaces from the top. Not To Worry. The Picture Filer will not forget how your picture used to look. Press the space bar and you will now see your picture with the spacing lines. Specify both the high and low crop marks by counting down from the top. Remember, the horizontal lines are at markings 10, 20, 30, ...170, 180. You may specify any number in between those marks if you need an exacting crop.

Press the space bar again and you will be asked what the high crop mark is. Remember that 0 is the top of the screen and 191 is the bottom of the screen. Likewise you will be asked what the low crop mark is. When you respond, the Picture Filer will ask you to specify the slot and drive in which you wish to file the picture. As soon as you have given that information, the Picture Filer will pause and ask you to insert your disk and press any key. Go ahead and do that.

MOVING ON

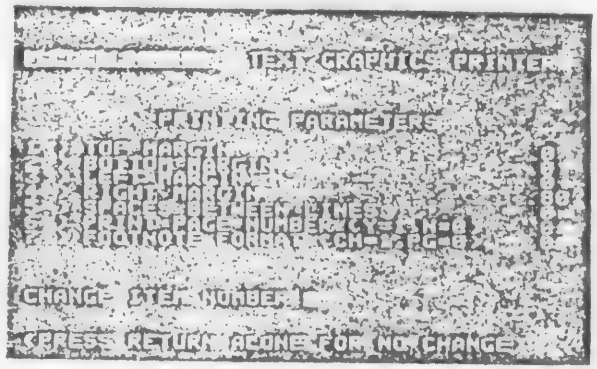
You will now see the GRAPHTRIX MENU again. Its starting to look a little more familiar now. There's only one option besides (0) QUIT that we haven't tried. That's the one where we get to see some action. It's time now to call in the cheering section and get ready to open the Champagne. Press (P) and go on to the next Chapter.

CHAPTER 6

PRINT A TEXT FILE

IF YOU ARE LOST...

This Chapter describes the operation of the GRAPHTRIX Printer. If you are here you should have read Chapters 1-5. You should have created an Apple Writer text file, translated it into a GRAPHTRIX text file, and filed any picture or graphic that you wish to have printed with your text. You should have chilled the bottle of Champagne and the cheering section should be warming up in the background. You should have pressed "P" PRINT A TEXT FILE and you should now see on your monitor screen:



If at any time while running this program you find that you have entered the wrong data, push CTRL C and then type RUN. You will then be able to start this program again.

USING THE GRAPHTRIX PRINTER

The GRAPHTRIX Printer will first give you a peek at the PRINTING PARAMETERS. You will see a menu of the four margins and a few other things. Let's discuss them. The TOP MARGIN is counted from the top and the BOTTOM MARGIN is counted from the bottom. The LEFT and the RIGHT margins are both counted from the left. The number of SPACES BETWEEN LINES is 0 for single spacing and 1 for double spacing and so on. The PRINT PAGE NUMBER function will center and print the page number (2 and higher) at the top of each page.

The last item may be the only unfamiliar one. When you choose to print your footnotes at END-OF-PAGE the GRAPHTRIX Printer will format each footnote as it is referenced and print it in compressed print on the bottom of the page on which it was referenced. If you choose to print your footnotes at END-OF-CHAPTER the GRAPHTRIX Printer will print your footnotes in a numerically ordered table at the end of your Chapter headed with "NOTES:". If you have no footnotes in your document it is best to specify END-OF-PAGE because this will prevent the printing of the footnote table heading at the end of your Chapter.

Once you are satisfied with this menu press RETURN and you will be asked to specify the slot and drive of both the text files disk and the graphics files disk. They can be the same disk of course, but for large documents you may want to split them. Please note that if you only have one disk drive the graphics files and the text files MUST be on the same disk. You will then be asked to give the title of the file. Remember that this is the title of the GRAPHTRIX text file as you specified when you translated it. Next you will be asked to specify the Chapter range to be printed. If you are working on one particular Chapter you can print that Chapter without printing a copy of the whole document. Last, but not least, you will be asked to specify the number of copies of the document that you wish to print. This number can be any number between 1 and 15. If you specify more than 15 copies you may get an OUT OF MEMORY error. If this happens simply RUN the program again without so many copies. You will now be given the final prompt. Make sure your disks are in the proper drives and that your printer is ON LINE. Gentlemen start your Apples.

HOME AGAIN

Once again you should be seeing the GRAPHTRIX MENU. By now it should be no mystery. Good luck with your printing. The only part of the GRAPHTRIX System that is left is the GRTX DUMP. This can be run totally indepentently of the Apple Writer and is an all purpose graphics printing package that you can use under your own program control. If you would like to change the centering functions of the GRAPHTRIX Printer try reading Appendix A - POKING AROUND. If you're a little beat after concentrating for so long on this manual try drinking the Champagne.

CHAPTER 7

THE GRTX DUMP

IF YOU ARE LOST...

This Chapter describes the function of the GRTX DUMP. The RTX DUMP is an all purpose utility screen dump program that n be called from any Applesoft program you might want to ite. If that went by a little fast, a screen dump program lows you to print on your line printer any graphic image that u may have created with Hi-Res Graphics. Of course your line inter is not going to print in color, but some really amazing fects can still be achieved in black and white. To run the TX DUMP you do not need to own or know how to use the Apple iter.

OAD 'EM UP

In order to use the GRTX DUMP utility it is first necessary o have it installed in memory. To do this type: RUN LOAD MP. This Applesoft program of two steps will load the GRTX UMP and reset the HIMEM in order to protect the program. LOAD UMP can be incorporated into any program of your own, but be careful to use it before you have defined any strings as it will clobber them. GRTX DUMP resides in your Apple's memory from location 34048 to 38144 or for those of you who eat everything in two bytes from $8500 to $9500.

PRINT 'EM OUT

Once you have installed the GRTX DUMP in memory you will be back in Applesoft. Create any image you like on either of the Apple's Hi-Res pages. When you are ready to print your graphic you will need to execute the CALL to the GRTX DUMP. The CALL statement takes the following format.

```
CALL 35000: REM M(x),P(y),(N or I),C,H(a),L(b),T"(title string)"
```

There is no need to initialize your printer with a PR# statement. The GRTX DUMP will take care of that and return your Apple to you in the same state as before the program was CALLed.

The CALL 35000 is the only part of the CALL statement that is required. Everything inside the REM statement is optional and can be in any order as long as each part is separated by commas. Let us examine the function of each of the optional parts inside the REM statement.

,M(x) Sets the magnifiction for any number x between 1 and 3. Default value on first reference is 1, subsequent references default to the last specified value. Refer to the Appendix A for the maximum magnification available for your printer.

,P(y) Sets the Hi-Res graphics page to number y, where y is either 1 or 2. Default value on first reference is 1, subsequent references default to the last specified value.

,(N or I) Sets the printing mode for either Normal or Inverse. A white line drawing on your black monitor screen will appear the same using N. The same drawing would appear as black lines on the white paper using I. Default on first reference is I. Subsequent references default to the last specified mode.

,C If you include a C in the REM statement, the graphic will be centered on one full sheet of paper. This is especially useful with the Anadex and Epson printers, because when they go into graphics mode they lose the top of form. Specifying a C will retain top of form as long as the page was on top of form when referenced. The Epson MX-100 when printing on 14" wide paper cannot utilize the C command. Default value is No Center on Page

,H(a) Sets the High crop mark to the number a. Remember that a must be between 0 and 190 and a must be less than b. Default value is 0.

,L(b) Sets the Low crop mark to the number b. Remember that b must be between 1 and 191 and that b must be greater than a. Default value is 191.

,T"(title string)" Specifies the title for the graphic. The title string can be any string of no more than 240 characters. The GRTX DUMP will center and print the title specified in compressed print. Default value on first reference is the null string. Subsequent references default to the last specified title string.

An example of a GRTX DUMP CALL statement would be:

```
100  CALL 35000 : REM P2,M1,N,C,H20,L150,T"CORD, TWINE, AND
     ROPE ARE SOME EXAMPLES"
```

DEFAULT VALUE SUMMARY

The GRTX DUMP when first called defaults to the following values: Hi-Res Page 1, Magnification 1, Inverse, No Center on Page, Hi Crop 0, Low Crop 191, No Title.

IMMEDIATE GRTX DUMP

GRTX DUMP can be accessed in the immediate mode by typing: CALL 35000. However all the other parts to the GRTX DUMP CALL will assume their default values. These default values though can be changed once GRTX DUMP is in memory. In order to change the default values refer to the following table:

Magnification x	POKE 34327,x
Hi-Res Page y	POKE 34328,y
Normal Mode (N)	POKE 35578,176
Inverse Mode	POKE 35578,144
Center on Page	POKE 34318,1
No Center on Page	POKE 34318,0
Hi Crop a	POKE 34279,a
Low Crop b	POKE 34280,b

MAPPING IT OUT

GRTX DUMP uses a number of memory locations on the Zero Page. These are: $EB-$EC and $F9-$FF. If you wish to change the horizontal centering functions of the GRTX DUMP, BLOAD it into memory and refer to Appendix A, Poking Around.

APPENDIX A

POKING AROUND

INTRODUCTION

This Appendix is sectioned with regard to each individual printer. Each printer has its own strong points, quirks and limitations as well as individual horizontal centering numbers. We recommend that you read the section on your printer.

ANADEX 9000/9001/9500/9501

The Anadex printers differ only in their dot size, type size, and carriage size. The 9000 is exactly the same as the 9500 with the exception of its shorter carriage. The same is true of the 9001 and the 9501. The only difference between the 9001/9501 and the 9000/9500 is their type size and dot spacing. The difference in dot spacings means that the two types of Anadex printers have different centering functions. It also means that the Anadex 9000/9500 can print only Magnification 1 on an 8.5 inch wide form and can print only Magnification 1 and 2 on a 14 inch wide form. Due to the unequal horizontal and vertical dot spacing in the 9500 your graphics will appear to be somewhat elongated in comparison to your screen graphic. The Anadex 9501 will not print Magnification 3 graphics without the optional expansion buffer. We recommend the user purchase this buffer even if they don't intend to print M3 graphics as it speeds the printing process considerably.

There are two versions of the way that the Anadex Printer handles control codes. The early version does not perform an automatic line feed on receipt of a Printer Control Code whereas the later versions do. The very first thing that your GRAPHTRIX Software does is to issue a control code to turn off the Auto Line Feed. On the later versions this control code will cause a line feed and throw your top of form off by one line when you exit the program. In order to defeat this problem we recommend you purchase an interface that has auto line feed as its default mode.

You will also notice that the Anadex printers have a routine that allows the GRAPHTRIX Software to give them graphic shortest logical path. Quite nifty.

ANADEX GRAPHIC CENTERING

If you want to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump first load that program into memory. The graphic is spaced a three digit number of dots from the left edge of the paper to the left edge of the graphic. Each of the three digits is stored in a different Byte. Example: If you wanted to specify a margin of 035 dots, x would equal 0, y would equal 3, and z would equal 5.

Magnification 1 — To specify a left margin of xyz dots:
POKE 34360,x
POKE 34357,y
POKE 34354,z

Magnification 2 — To specify a left margin of xyz dots:
POKE 34361,x
POKE 34358,y
POKE 34355,z

Magnification 3 — To specify a left margin of xyz dots:
POKE 34362,x
POKE 34359,y
POKE 34356,z

If you change the graphic margin you must change the title margin as well. The title margin is counted from the left in compressed print character spaces. If you wish to specify a title margin of n:

Magnification 1 POKE 34293,n
Magnification 2 POKE 34294,n
Magnification 3 POKE 34295,n

The graphic margins specified in the GRAPHTRIX CONFIGURE program are as follows:

	ANADEX 9000/9500		ANADEX 9001/9501	
	8.5 in	14 in	8.5 in	14 in
M1	094	256	164	365
M2	xxx	116	010	220
M3	xxx	xxx	xxx	075

The title margins specified in the CONFIGURE program are as follows:

	ANADEX 9000/9500		ANADEX 9001/9501	
	8.5 in	14 in	8.5 in	14 in
M1	22	58	38	83
M2	xx	27	10	55
M3	xx	xx	xx	26

CENTRONICS 739/122

The Centronics 739 and 122 are very much the same in performance with the exception of the 122 being unable to access compressed print size. The Centronics 739 and 122 both allow two Magnifications using 8.5 inch paper, but the 122 can print 3 Magnifications with 14 inch paper. The dot spacing is equal in both horizontal and vertical directions so the Graphic is well proportioned. The Auto Line Feed switch must be OFF. A parallel interface that defaults to Auto Line Feed is recommended for the Centronics printers in that the Auto Line Feed in the printer may remain off and you may still list your programs or print from an immediate mode without turning the Auto Line Feed on. Strangely enough the Apple Centronics interface does NOT default to Auto Line Feed and thus is not recommended. The Centronics printers use a Data Compression technique that forces the print head to return if the graphic is more than a certain degree of complexity. Therefore on some lines you may see the Centronics print head return to the left margin after printing part of a line then go back to print the rest of the line. This is internal in the Centronics machine and is NOT generated by your GRAPHTRIX Software. The final product will look just fine.

CENTRONICS GRAPHIC CENTERING

If you wish to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump first BLOAD the program into memory. The graphic is spaced a number of dots from the left.

To Specify a Graphic Margin of x dots:

Magnification 1 POKE 34354,x
Magnification 2 POKE 34355,x
Magnification 3 POKE 34356,x

If you change the Graphic Margin you must change the Title

Margin as well. The Title margin is counted from the left in compressed character spaces.

To Specify a Title Margin of x spaces:

Magnification 1 POKE 34293,x
Magnification 2 POKE 34294,x
Magnification 3 POKE 34295,x

The Graphic Margins specified in the CONFIGURE Program are as follows:

	739	122	
	8.5in	8.5in	14in
Magnification 1	155	142	71
Magnification 2	1	1	181
Magnification 3	xxx	xxx	36

The Title Margins specified in the CONFIGURE Program are as follows:

	739	122	
	8.5in	8.5in	14in
Magnification 1	36	22	48
Magnification 2	10	4	29
Magnification 3	xx	xx	10

EPSON MX-70/MX-80/MX-100

The EPSON MX-70 needs no special switch settings or other special care. We recommend that you use the EPSON APL Parallel Interface Card. There is only one magnification available on the MX-70 and it is slightly elongated due to the differing horizontal and vertical dot spacings.

The EPSON MX-80 must be equipped with the Graftrax-80 or Graftrax Plus Graphics ROMs available from EPSON America in order to print dot matrix graphics. The MX-80 can achieve truly amazing resolution with a 120 x 140 dot matrix. Three magnifications are thus available on the MX-80. Magnification 1 is quite tiny and could be useful for a company logo or letterhead. Magnification three takes up the entire 8 printable inches of paper width. The MX-80 with Graftrax-80 loses its top of form when it goes into graphics mode, though the GRAPHTRIX Printer keeps track for it. When using the GRTX Dump be sure to remember that where the paper stops is where

the MX-80 thinks the top of form is. Be careful when printing large spaces of solid black. We have heard reports that it is possible to overheat and burn the printhead, although we have not had that experience in our testing of the MX-80. We recommend the EPSON APL Parallel Interface card for use with the EPSON MX-80 and with the MX-100.

The EPSON MX-100 performs exactly the same as the MX-80 when you are using 8 1/2 x 11 paper. When you are using 14 x 11 paper we have changed the magnifications available to the GRTX Dump and the HAND-HOLDING SCREEN DUMP. Magnification 3 now takes up a full large sheet of paper. However we were not able to implement the page centering function for these larger magnifications.

Before you start printing with your EPSON MX-80 or MX-100 you must have the internal dip switches properly set. We have included a table of the proper settings for each printer. The dip switches represent different functions on the two printers.

	MX-80	MX-100		MX-80	MX-100
S1-1	OFF	*OFF	S2-1	OFF	ON
S1-2	*ON	*OFF	S2-2	OFF	ON
S1-3	*ON	OFF	S2-3	*OFF	*OFF
S1-4	OFF	OFF	S2-4	*OFF	*ON
S1-5	OFF	*OFF			
S1-6	OFF	ON			
S1-7	OFF	ON			
S1-8	*ON	*ON			

The switch settings marked with a "*" are required to be at that setting for proper operation. The other switch settings are optional, but preferred.

EPSON GRAPHIC CENTERING

If you want to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump first BLOAD that program into memory. The Graphic is spaced from the left. The MX-80 and MX-100 use condensed spacing for more exacting placement.

To Specify a Graphic Left Margin of x:

Magnification 1 POKE 34354,x
Magnification 2 POKE 34355,x
Magnification 3 POKE 34356,x

If you change the Graphic Margin you must change the Title Margin. The Title Margin is counted from the left. Once again the MX-80 and MX-100 use condensed print spacing.

To Specify a Title Margin of x:

Magnification 1 POKE 34293,x
Magnification 2 POKE 34294,x
Magnification 3 POKE 34295,x

he Graphic Margin specified in the CONFIGURE program is as ollows:

	MX-70	MX-80	MX-100	
	8.5 in	8.5 in	8.5 in	14 in
1	15	46	46	77
2	xx	26	26	57
3	xx	05	05	18

ne Title Margin Specified in the CONFIGURE Program is as ollows:

	MX-70	MX-80	MX-100	
	8.5 in	8.5 in	8.5 in	14 in
M1	18	49	49	90
M2	xx	28	28	62
M3	xx	12	12	25

IDS 440/445/460/560

The IDS 440 and 445 are virtually indistinguishable. The only substantive difference is that the 445 print head is manufactured by IDS themselves. Only one magnification is available on the 440/445 and the graphic image is slightly elongated due to the differing horizontal and vertical dot spacings.

The IDS. 460 and 560 differ only in their carriage width. The graphic dots are evenly spaced horizontally and vertically at 84/inch. The Auto Line Feed switch must be disabled in order to have proper vertical register when running the GRTX Printer.

Two magnifications are available on an 8 1/2" wide paper

and three magnifications are available on 14" wide paper. We recommend an interface that defaults to Auto Line Feed with the IDS Printers so that you needn't switch the Auto Line Feed off and on in the printer when using the GRAPHTRIX Software.

IDS GRAPHIC CENTERING

If you wish to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump first load that program into memory. The graphic is spaced from the left edge of the paper to the left edge of the graphic with a margin that is counted in normal print spaces. To specify a left graphic margin of n spaces:

Magnification 1 POKE 34354,n
Magnification 2 POKE 34355,n
Magnification 3 POKE 34356,n

If you change the graphic margin you must also change the title margin. The title margin is counted from the left in compressed spaces. To specify a title margin of n spaces:

Magnification 1 POKE 34293,n
Magnification 2 POKE 34294,n
Magnification 3 POKE 34295,n

The graphic margin specified in the CONFIGURE program is as follows:

	IDS 460		IDS 560		IDS 440/445
	8.5 in	14 in	8.5 in	14 in	8.5 in
M1	29	xx	29	54	110
M2	6	xx	6	31	xx
M3	xx	xx	xx	8	xx

The title margin specified in the CONFIGURE program is as follows:

	IDS 460		IDS 560		IDS 440/445
	8.5 in	14 in	8.5 in	14 in	8.5 in
M1	44	xx	44	80	36
M2	11	xx	11	47	xx
M3	xx	xx	xx	14	xx

ITOH 8510 and NEC 8023

The ITOH 8510 and NEC 8023 are the same printer in different cases. They print quite precise graphics and have a nice character set. Two magnifications can be accessed on 8.5 inch paper. The two printers have a small problem with placement of their graphic lines due to their bidirectional graphic printing. We have inserted a compensating half pixel on every other graphic line to try to compensate for that problem. You can adjust the print head alignment further with an adjustment pot located under the print head track next to the dip switches. The dip switches must be set as follows:

SW 1-8 OPEN	SW 2-8 OPEN
SW 1-7 CLOSED	SW 2-7 CLOSED
SW 1-6 OPEN	SW 2-6 OPEN
SW 1-5 OPEN	SW 2-5 OPEN
SW 1-4 OPEN	SW 2-4 OPEN
SW 1-3 OPEN	SW 2-3 OPEN
SW 1-2 CLOSED	SW 2-2 OPEN
SW 1-1 OPEN	SW 2-1 CLOSED

ITOH AND NEC GRAPHIC CENTERING

If you wish to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump first BLOAD the program into memory. The graphic is spaced a number of dots from the left.

To Specify a Graphic Margin of x dots:

Magnification 1 POKE 34354,x
Magnification 2 POKE 34355,x

If you change the Graphic Margin you must change the Title Margin as well. The Title margin is counted from the left in compressed character spaces.

To Specify a Title Margin of x spaces:

Magnification 1 POKE 34293,x
Magnification 2 POKE 34294,x

The Graphic Margins specified in the CONFIGURE Program are as follows:

Magnification 1 48
Magnification 2 06

The Title Margins specified in the CONFIGURE Program are as

follows:

Magnification 1 39
Magnification 2 06

MPI 88G

The MPI 88G allows two graphic magnifications. The Auto Line Feed switch must be OFF. We recommend using interfaces that default to Auto Line Feed. With these cards you will not have to turn the Auto Line Feed on and off in the printer every time you use the GRAPHTRIX Software.

If you wish to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump first BLOAD that program into memory. The graphic is spaced a number of dots from the left.

To specify a Graphic Margin of x Dots:

Magnification 1 POKE 34354,x
Magnification 2 POKE 34355,x

If you change the Graphic Margin you must change the Title Margin as well. The Title Margin is counted from the left in compressed character spaces.

To specify a Title Margin of x spaces

Magnification 1 POKE 34293,x
Magnification 2 POKE 34294,x

The Graphic Margins specified in the CONFIGURE Program are as follows:

Magnification 1 160
Magnification 2 10

The Title Margins specified in the CONFIGURE Program are as follows:

Magnification 1 38
Magnification 2 10

NEC 8023

See ITOH 8510. They are the same machine with different covers.

OKIDATA 82A/83A/84

The OKIDATA 82A and 83A are virtually the same printer with the exception of the longer carriage on the 83A. Only one magnification is available on the 82A and the graphic images on both the 82A and 83A printers are slightly elongated due to the differing horizontal and vertical dot spacings. The 84 can print two Magnifications on 8.5 inch paper and can accomplish 3 magnifications on 14 inch paper. The dot pattern is quite tight on the 84 and it has proved to be one of the most precise of the printers we have tested. You may turn off the double strike print function of the 84 used by the GRTX Printer by inserting the following line in the configure program and then running it. 11220 POKE 34480,96. Deleting that line will turn the emphasis back on. The Auto Line Feed switch must be disabled in order to have proper vertical register when running the GRTX Printer. For this reason we recommend using an interface that defaults to Auto Line Feed mode.

If you wish to change the horizontal placement of your graphics in either the GRTX Printer or the GRTX Dump, first load that program into memory. The graphic is spaced from the left edge of the paper to the left edge of the graphic with a margin that is counted in graphic dots of 1/60th of an inch. To specify a left graphic margin of n dots:

Magnification 1	POKE 34354,n
Magnification 2	POKE 34355,n
Magnification 3	POKE 34356,n

If you change the graphic margin you must also change the title margin. The title margin is counted from the left in compressed spaces. To specify a title margin of n spaces:

Magnification 1	POKE 34293,n
Magnification 2	POKE 34294,n
Magnification 3	POKE 34295,n

The graphic margin specified in the CONFIGURE program is as follows:

	OKIDATA 82A	OKIDATA 83A		OKIDATA 84	
	8.5 in	8.5 in	14 in	8.5 in	14 in
M1	91	91	271	74	169
M2	xx	xx	131	00	97
M3	xx	xx	xxx	xx	24

The title margin specified in the CONFIGURE program is as

follows:

	OKIDATA 82A	OKIDATA 83A		OKIDATA 84	
	8.5 in	8.5 in	14 in	8.5 in	14 in
M1	32	32	82	39	84
M2	xx	xx	44	7	53
M3	xx	xx	xx	xx	20

SILENTYPE

The Silentype printer can print only one magnification. It is automatically set for the unidirectional mode before a graphic is printed. If you wish to change the graphic and title margins, refer to the MPI section. The Graphic Margin specified in the CONFIGURE Program is 18 and the Title Margin is 19.

TRENDCOM

The Trendcom printer is the same printer as the Silentype without the Apple specific roms. Treat it just as you would a Silentype from the GRAPHTRIX program.

APPENDIX B

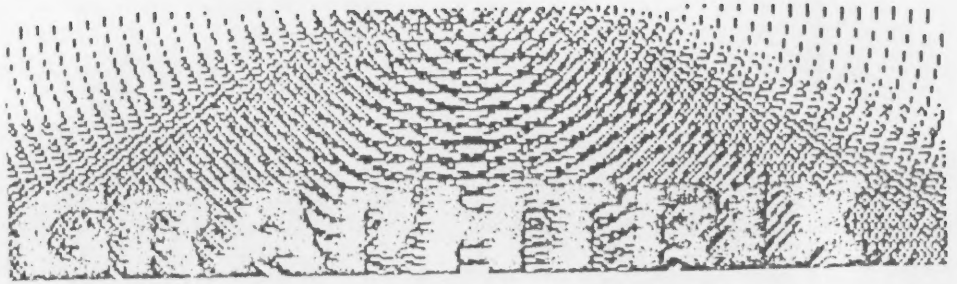
HI-RES PAGE SHIFT

USING PS

Your GRAPHTRIX disk contains one more little utility program named PS. If you need to shift a graphic from one Hi-Res Page to another quickly, PS can do the trick.

Simply BLOAD PS into memory and then if you wish to shift a graphic from Page 2 to Page 1 then just CALL 784.

If you want to shift a graphic from Page 1 to Page 2 then POKE 791,32 and POKE 795,64. Now if you CALL 784 you Shift your Graphic from Page 1 to Page 2.



FROM DATA TRANSFORMS INC. THE GRAPHIC LEADER